

## **Appendix A1.** Project design standards for all restoration activities.

### **General Requirements**

1. All regulatory permits and official project authorizations must be secured before project implementation. Follow all terms and conditions included in these documents.
2. The Oregon guidelines for the timing of in-water work must be followed for each affected stream reach when completing restoration activities requiring in-water work. The timing of in-water work may be extended if the Oregon Department of Fish and Wildlife approves an extension based on current year site specific conditions. In-water work should occur during the lowest water period within the timing guidelines for the affected stream reach.
3. Significant modifications to a project work plan must be reviewed and approved by appropriate agency personnel and the landowner(s) before completing the modifications.
4. Explosives (*i.e.*, dynamite and gun powder) must not be used on a project site.
5. Pesticides must not be used to control or remove invertebrate and vertebrate species and microorganisms (*e.g.*, viruses, bacteria, and fungi).
6. Herbicides must not be used to control or remove invasive and non native vegetation.
7. Monitoring, as necessary, is required for at least one year following completion of a project.

### **Equipment Operation**

1. Use existing roads or travel paths to access project sites whenever possible.
2. All temporary access roads for equipment must be constructed as follows:
  - Use existing roads and travel paths whenever possible, unless construction of a new road or path would result in less habitat loss.
  - Temporary roads and paths must not be built mid-slope or on slopes steeper than thirty percent.
  - Minimize soil disturbance and compaction whenever a new temporary road or path is necessary within 150 feet<sup>24</sup> of a stream, water body, or wetland by clearing vegetation to ground level and placing clean gravel over geotextile fabric, unless otherwise approved by the Fish and Wildlife Service.
  - Minimize the number of temporary stream crossings.
  - Survey any potential spawning habitat within 300 feet downstream of a proposed stream crossing. Do not place a temporary stream crossing at known or suspected spawning areas, or within 300 feet upstream of such areas if spawning areas may be affected.
  - Design a temporary stream crossing to provide for foreseeable risks (*e.g.*, flooding and associated bedload and debris, to prevent the diversion of stream flow out of the channel and

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<sup>24</sup> Distances from a stream or water body are measured horizontally from, and perpendicular to, the bankfull elevation, the edge of the channel migration zone, or the edge of any associated wetland, whichever is greater. "Channel migration zone" means the area defined by the lateral extent of likely movement along a stream reach as shown by evidence of active stream channel movement over the past 100 years (*e.g.*, alluvial fans or floodplains formed where the channel gradient decreases, the valley abruptly widens, or at the confluence of larger streams).

- down the road if the crossing fails).
  - Vehicles and machinery must cross riparian areas and streams at right angles to the main channel whenever possible.
  - When a project is complete, obliterate all temporary access roads that will not be in footprint of a new bridge or other permanent structure, stabilize the soil, and revegetate the site. Abandon and restore temporary roads in wet or flooded areas by the end of the local in-water work period.
3. Equipment must be limited in capacity, but sufficiently sized to complete required restoration activities. When heavy equipment will be used, the equipment selected must have the least adverse effects on the environment (*e.g.*, minimally sized, low ground pressure equipment).
  4. Minimize the use of equipment in or adjacent to a stream channel to reduce sedimentation rates and channel instability.
  5. Aquatic and riparian habitats must not be used as equipment staging or refueling areas. Locate these areas 150 feet or more from any stream, water body, or wetland. (Note: This distance must be greater if a staging or refueling area is up slope from an aquatic or riparian habitat). These areas should be used to store equipment, supplies, materials, and fuels, and for the cleaning, maintenance, and refueling of equipment.
  6. To reduce potential contamination, limit the size of staging and refueling areas and only store enough supplies, materials, and equipment on-site to complete the project.
  7. All equipment operated within 150 feet of an aquatic habitat, must be inspected daily for fluid leaks before leaving the equipment staging area. All detected leaks must be repaired in the staging area before the equipment resumes operation.
  8. All equipment must be cleaned to remove external oil, grease, dirt, and mud before beginning operations below the bankfull elevation of a stream.
  9. All stationary power equipment (*e.g.*, generators) operated within 150 feet of any aquatic habitat must be diapered to prevent leaks and/or enclosed in a containment device (*e.g.*, non permeable drip pan) of adequate capacity to retain equipment fluids (*e.g.*, gasoline, diesel fuel, and oil) if a leak occurs.

#### **Pollution and Erosion Controls**

1. A written hazardous spill contingency plan must be developed for all project sites where hazardous materials (*e.g.*, fuels, oils, and fertilizers) will be used or stored. For information on your role in a spill response, please review the Oregon Department of Environmental Quality (ODEQ) fact sheet at the following web site:  
<http://www.deq.state.or.us/wmc/cleanup/factsheets/WhatToExpectWhenYouHaveSpilled.pdf>.
2. Appropriate materials and supplies (*e.g.*, shovels, disposal containers, absorbent materials, first aid supplies, and clean water) must be available on-site to cleanup any small accidental spill. Responding personnel must be trained in dealing with the spill.
3. Hazardous spills must be reported to the Oregon Emergency Response System at 1-800-452-0311 (system available 24 hours a day). Please review the ODEQ emergency response web site at <http://www.deq.state.or.us/wmc/cleanup/spl0.htm> for more information.

4. The removal, transport, and disposal of hazardous materials must be done according to U.S. Environmental Protection Agency and ODEQ regulations.
5. All hazardous materials must be handled in strict accordance to label specifications. Proper personal protection (*e.g.*, gloves, face masks, and clothing) must be worn by all personnel handling hazardous materials. Obtain a copy of the material safety data sheet from the manufacturer for detailed information on each hazardous material. Contact the Oregon Poison Control Center at 1-800-222-1222 (24 hours) for assistance in responding to emergency exposures.
6. Install hazardous material containment booms in situations where there is a potential for release of petroleum or other toxicants in aquatic habitats or construct containment berms in non aquatic habitats.
7. Contaminated or sediment laden water from a construction project (*e.g.*, concrete washout, pumping for work area isolation, and vehicle wash water) must not be discharged directly or indirectly into any aquatic habitat until it has been treated by a proper method (*e.g.*, bioswale, filter system, and settlement pond).
  - Design, build, and maintain facilities to collect and treat all construction discharge water using the best available technology applicable to site conditions. Provide treatment to remove debris, nutrients, sediment, petroleum hydrocarbons, metals and other pollutants likely to be present.
  - If construction discharge water is released using an outfall or diffuser port, velocities must not exceed four feet per second, and the maximum size of any aperture must not exceed one inch.
  - Do not release construction discharge water within 300 feet upstream of active spawning areas or areas with submerged aquatic vegetation.
  - Do not allow pollutants including green concrete, contaminated water, silt, welding slag, sandblasting abrasive, or grout cured less than 24 hours to contact any wetland or the two year floodplain.
8. Store construction waste in leak-proof containers until they can be transported off-site for recycling, reuse, or disposal at an upland facility approved to accept the specific waste. Project personnel must remove all waste from the project site at the completion of the project.
9. Temporary erosion controls must be installed at all project sites where restoration activities will result in soil disturbance and the potential for sediment transport. Controls must remain in place and be maintained until vegetation is established at the sites or as needed to prevent erosion. Controls include, but are not limited to, silt fences, straw bales<sup>25</sup>, sandbags, jutte mats, coffer dams, water bladders, and coconut logs.
10. During construction, all erosion controls must be inspected daily during the rainy season and weekly during the dry season to ensure they are working adequately<sup>26</sup>.
  - If monitoring or inspection shows that the erosion controls are ineffective, mobilize work

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<sup>25</sup> When available, certified weed-free straw or hay bales must be used to prevent introduction of invasive and non native weeds.

<sup>26</sup> "Working adequately" means that project activities do not increase ambient stream turbidity by more than ten percent when measured relative to a control point immediately upstream of the turbidity causing activity.

crews immediately to make repairs, install replacements, or install additional controls as necessary.

- Remove sediment from erosion controls once it has reached one-third of the exposed height of the control.
  - Sediments collected behind erosion control structures must be removed and stabilized at an appropriate upland disposal site immediately after the completion of a project.
11. Emergency erosion controls (*e.g.*, silt fences and straw bales) must always be available on-site whenever surface water is present at a project site.
  12. An oil-absorbing floating boom must be present on-site when operating heavy equipment within 50 feet of aquatic habitats.
  13. Locate stockpile areas on or immediately beside a project site whenever possible, but at least 150 feet from aquatic habitats. Erosion controls must be implemented around stockpiled materials, as needed, to prevent the introduction of pollutants into the surrounding areas.
  14. Excess excavated materials removed during the completion of a project must be disposed of properly and stabilized to eliminate future environmental problems. Disposal sites must not be located in aquatic or riparian habitats or floodplains.
  15. Concrete structures used in open-bottom culvert and bridge installations (*e.g.*, vault sections, footers, wing walls, and abutments) must be cured before they are placed in aquatic habitats.

#### **Construction Techniques**

1. The boundary of a project site must be flagged to prevent soil disturbance to areas outside the site. Confine construction impacts to the minimum area necessary to complete the project.
2. Limit the removal of any native vegetation to the amount that is absolutely necessary to complete a construction activity.
3. Conserve native materials for site restoration as follows:
  - Leave native materials where they are found, whenever possible.
  - Replace native materials that are damaged or destroyed with functional equivalents during site restoration.
  - Stockpile any large wood, native vegetation, weed-free topsoil, and native channel material displaced by construction for use during site restoration.
4. Completely isolate an in-water work area from the active flowing stream using inflatable bladders, sandbags, sheet pilings, or similar materials if adult or juvenile fish are reasonably certain to be present, or if the work area is 300 feet upstream of spawning habitats. This does not apply to the placement of large woody debris and boulders to construct fish habitat structures.
5. Fish screens must be installed, operated, and maintained according to NOAA Fisheries' fish screen criteria<sup>27</sup> on each water intake used for project construction, including pumps used to

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<sup>27</sup> National Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile Fish Screen Criteria for Pump Intakes* (May 9, 1996) (guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (<http://www.nwr.noaa.gov/1hydroweb/ferc.htm>). Note: New criteria are currently being drafted by NOAA

isolate an in-water work area.

6. Institute practices that prevent construction materials and debris from dropping into aquatic habitats. Remove any materials that do drop in with a minimal amount of disturbance to these habitats.
7. Cease project operations under high stream flow conditions that may result in inundation of the project area, except for efforts to minimize or eliminate resource damage.
8. Temporary coffer dams built as a part of a project must use materials from non streambed sources that are free of fines. Upon project completion, coffer dams must be removed from the stream or feathered out in the stream channel.
9. Stream banks damaged from project activities must be restored to a natural slope, pattern, and profile that are suitable for the establishment of permanent herbaceous and/or woody vegetation as appropriate.
10. Stabilize all disturbed areas following any break in work unless construction will resume within seven days.

#### **Restoration Materials**

1. The use of non native vegetation will be limited to situations where appropriate native vegetation (*e.g.*, grasses) is not commercially available or would not meet immediate project goals (*e.g.*, temporary cover using sterile wheatgrass). Non native vegetation planted at a project site must be a close subspecies or variety to native species or reproductively altered (*i.e.*, sterilized) to avoid future ecological complications with native species. The Fish and Wildlife Service must review and approve the use of non native vegetation on project sites before project implementation.
2. Native vegetation must be planted on disturbed sites within thirty days of disturbance (including the project site, disposal and staging areas, and access roads) to reduce erosion, establish cover, provide shade, and prevent non native plant colonization. Non native vegetation may be planted (*see item 1 above*) if soil disturbances occur outside of the appropriate planting periods for native vegetation (*i.e.*, replanting of native vegetation must occur before the first April 15 following construction). Erosion controls must remain in place at disturbed sites until vegetation is well established.
3. Replant each area requiring revegetation using a diverse assemblage of species native to the project area or region, including grasses, forbs, shrubs and trees. Invasive and noxious species must not be used for revegetation.
4. Obtain project boulders, rock, and large wood<sup>28</sup> outside of aquatic habitats. These materials must also be obtained during appropriate seasonal periods to minimize or eliminate soil disturbance and

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Fisheries.

<sup>28</sup> "Large wood" means a tree, log, or rootwad big enough to dissipate stream energy associated with high flows, capture bedload, stabilize streambanks, influence channel characteristics, and otherwise support aquatic habitat function, given the slope and bankfull channel width of the stream in which the wood occurs. See Oregon Department of Forestry and Oregon Department of Fish and Wildlife, *A Guide to Placing Large Wood in Streams*, May 1995 (<http://www.nwr.noaa.gov/1salmon/salmesa/4ddocs/lrgwood.pdf>).

compaction.

5. Riparian timber stands must not be harvested to supply large wood to complete a restoration activity.
6. A limited number of trees in upland timber stands may be harvested for large wood to complete a restoration activity, but methods of selection and harvest must be reviewed and approved by the Fish and Wildlife Service before completing a timber harvest.
7. Down coarse woody debris<sup>29</sup> and boulders in riparian and upland habitats may be used to complete a restoration activity, but these materials must remain at or near their original locations to maintain the natural (or current) characteristics of the local area. Methods of selection, collection, and use must be reviewed and approved by the Fish and Wildlife Service before completing the activity.

#### **Pressure Treated Wood Products**

1. Pressured treated wood<sup>30</sup> containing water-borne or oil-borne preservatives must not be placed in areas where they will be in constant contact with standing or moving water or placed over water where they will be exposed to mechanical abrasion or leachate may enter aquatic habitats (*e.g.*, bridge construction or decking at a road-stream crossing).
2. Dispose of treated (preserved) wood debris removed during a project at an upland facility approved for hazardous materials of this classification. Do not allow any treated wood debris (*i.e.*, saw dust and scrape wood) to be stacked next to or enter any aquatic habitat (*e.g.*, stream, wetland, and pond).
3. Treated wood debris or products that fall into any aquatic habitat must be removed immediately.
4. Treated wood products used for authorized structures must be certified as to being produced using the most current version of the American Wood-Preservers Association best management practices.
5. Treated wood products of unknown origin or method of treatment must not be used for any restoration application.
6. A project specific biological assessment must be written if pressure treated wood products are not used according to the conditions stated above. This process may result in NOAA Fisheries and Fish and Wildlife Service issuing biological opinions under the Endangered Species Act for the project.

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<sup>29</sup> "Coarse woody debris" consists of snags, fallen logs, wind blown trees, and large branches.

<sup>30</sup> "Treated wood" means lumber, pilings, and other wood products preserved with alkaline copper quaternary (ACQ), ammoniacal copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), copper naphthenate, chromated copper arsenate (CCA), pentachlorophenol, or creosote.

## Fish and Wildlife Requirements

1. Complete restoration activities at a project site in a timely manner. This will reduce disturbance and displacement of fish and wildlife in the project area.
2. Provide passage for any adult or juvenile salmonid species present in the project area during construction, unless otherwise approved in writing by the Fish and Wildlife Service. Upstream passage is not required during construction if it did not previously exist.
3. Before and intermittently during pumping to isolate an in-water work area, an attempt must be made to capture and release federally listed fish species from the isolated area using trapping, seining, electrofishing, or other methods as are prudent to minimize risk of injury to them.
  - The entire capture and release operation must be conducted or supervised by a fishery biologist experienced with work area isolation and competent to ensure the safe handling of all listed fish.
  - Do not use seining or electrofishing if water temperatures exceed 18° C.
  - If electrofishing equipment is used to capture fish, comply with NOAA Fisheries' electrofishing guidelines<sup>31</sup>.
  - Handle listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.
  - Transport fish in aerated buckets or tanks.
  - Release fish into a safe release site as quickly as possible and as near as possible to capture sites.
  - Do not transfer listed fish to anyone except NOAA Fisheries' or Fish and Wildlife Service' personnel as appropriate, unless otherwise approved in writing by the respective Federal agency.
  - Obtain all Federal, State, and local permits necessary to conduct the capture and release activity.
  - Fish and Wildlife Service and NOAA Fisheries' personnel or its designated representative must be allowed to accompany the capture team during capture and release activities.
  - A report must be prepared addressing the capture and release of listed fish species during the isolation of an in-water work area. The report must include the following:
    - ▶ Supervisory fish biologist's name and address.
    - ▶ Methods of work area isolation.
    - ▶ Stream conditions before, during, and after completion of work area isolation.
    - ▶ Methods and means of fish capture.
    - ▶ Number of fish captured by species.
    - ▶ Location and physical condition of all fish released.
    - ▶ Any incidence of observed injury or mortality to listed fish.

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<sup>31</sup> National Marine Fisheries Service, *Backpack Electrofishing Guidelines* (December 1998) (<http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf>).

4. An attempt must also be made to capture and release non listed fish and wildlife (*e.g.*, amphibians and reptiles) from isolated work areas as addressed above. Consult with the Fish and Wildlife Service or Oregon Department of Fish and Wildlife for guidance on capture and release techniques for these species.